Case No. 3091

Application, Transcripts, Small Exhibits, Etc.

Memo

From
D. S. NUTTER
CHIEF ENGINEER

To Dual Comp conv.
N. Wilson Deep Unit No 1
SW SE 31 20 36
1/2 3/8" tubing
Commingle Upper & Lower Bone Spg

OPERATOR: THE BRITISH-AMERICAN OIL PRODUCING CO.

WELL: NORTH WILSON DEEP UNIT NO. 1

LOCATION: UNIT O, SECTION 31, T 20S, R 32E LEA COUNTY, NEW MEXICO

Schematic of Dual Completion

DEPTH, KB. 0'

500'

5300'

5400'

7500'

7750'

8000'

9500'

9750'

10,000'

10,250'

11,000'

12,000'

13⅜" O.D. (cmtd. w/525 sx. cmt. to surface)

{9⅝" O.D. csg. cemented w/5251 cu. ft. top of cement @ 500'}

9⅝" O.D.
@ 5349' KB

2⅜ O.D. tubing

{Cmtd 7" O.D. csg. w/1165 sx
top of cmt. @ 5830}

Brown HS-17-2C
Packer set at
7850' KB

Upper Bone Springs Perfs. 7888-7901

Brown HS-16-1C
packer set at
10,070' KB

Lower Bone Springs Perfs. 10,094-10,122

PSD 11,755

7" O.D.
@ 11,555' KB

DRAFT

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

CF Subj. _____

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3091

Order No. R-2755

APPLICATION OF THE BRITISH-AMERICAN
OIL PRODUCING COMPANY FOR A DUAL COM-
PLETION AND POOL COMMINGLING, LEA
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 22, 1964, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this _____ day of July, 1964, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, The British-American Oil Producing Company, seeks authority to complete its North Wilson Deep Unit Well No. 1, located in Unit O of Section 31, Township 20 South, Range 36 East, NMPM, Lea County, New Mexico, as a dual completion (conventional) to produce oil from the [redacted] Upper Bone Spring formation and the _____ Lower Bone Spring formation through parallel strings of 2 3/8-inch tubing, with separation of zones by a packer set at approximately 10,070 feet.

(3) That the mechanics of the proposed dual completion are feasible and in accord with good conservation practices.

(4) That approval of the proposed dual completion will prevent waste and protect correlative rights.

(5) That the applicant also seeks authority to commingle the _____ Upper Bone Spring and the _____ Lower Bone Spring ~~Pool~~ production from its North Wilson Deep Unit ~~Well~~ No. 1 after separately metering the production from the _____ ~~Upper Lower~~ Bone Spring ~~Pool~~ formation and determining the Lower Bone Spring production by means of the subtraction method.

(6) That approval of the proposed commingling installation will result in convenience and economy to the operator, will be in the interest of conservation, and will otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, The British-American Oil Producing Company, is hereby authorized to complete its North Wilson Deep Unit Well No. 1, located in Unit O of Section 31, Township 20 South, Range 36 East, NMPM, Lea County, New Mexico, as a dual completion (conventional) to produce oil from the _____ Upper Bone Spring ~~Pool~~ formation and the _____ Lower Bone Spring ~~Pool~~ formation through parallel strings of 2 3/8 -inch tubing, with separation of zones by a packer set at approximately 10,070 feet;

PROVIDED HOWEVER, that the applicant shall complete, operate, and produce said well in accordance with the provisions of Rule 112-A of the Commission Rules and Regulations insofar as said rule is not inconsistent with this order;

PROVIDED FURTHER, that the applicant shall take packer-leakage tests upon completion and annually thereafter during the Gas-Oil Ratio Test Period for the _____ Lower Bone Spring ~~Pool~~ formation.

(2) That the applicant is hereby authorized to commingle the _____ Upper Bone Spring and the _____ Lower

Bone Spring ~~Pool~~ production from its North Wilson Deep Unit Well No. 1 after separately metering the production from the _____ Upper ~~Lower~~ Bone Spring formation and determining the Lower Bone Spring production by means of the subtraction method;

PROVIDED HOWEVER, that said installation shall be operated in accordance with the provisions of the Commission's "Manual for the Installation and Operation of Commingling Facilities."

(3) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

Case 309

MAIN OFFICE OCC

NEW MEXICO OIL CONSERVATION COMMISSION

1954 JUL 6 AM 7 35

SANTA FE, NEW MEXICO

Application of The British-American Oil Producing Company for dual completion of the North Wilson Deep Unit No. 1 well located in the SW¼SE¼ Section 31, Township 20 South, Range 36 East, Lea County, New Mexico and to commingle the production of oil from the Upper Bone Springs Pool and the Lower Bone Springs Pool within the North Wilson Deep Unit Area, Lea County, New Mexico

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Comes The British-American Oil Producing Company acting by and through the undersigned attorneys, and hereby makes application for the dual completion of the North Wilson Deep Unit No. 1 well located in the SW¼SE¼ Section 31, Township 20 South, Range 36 East, Lea County, New Mexico, so as to produce oil from both the Upper Bone Springs Pool and the Lower Bone Springs Pool through parallel strings of tubing and also to commingle the production from the Upper Bone Springs Pool and the Lower Bone Springs Pool at the surface within the North Wilson Deep Unit Area and in support thereof respectfully shows:

1. That applicant, as Unit Operator for the North Wilson Deep Unit Area, has caused the initial test well to be drilled pursuant to the terms of the Unit located in the SW¼SE¼ Section 31, Township 20 South, Range 36 East, and to be completed as a well capable of producing oil in paying quantities from both the Upper Bone Springs Pool and the Lower Bone Springs Pool, said dual completion having been accomplished by two parallel strings of 2 3/8" O.D. tubing and by the setting of packers so as to segregate the production from the two separate pools so that the production from each pool can be separately produced and measured. That there is attached hereto the Commission form of application for dual completion setting forth all of the material facts and

DOCKET MAILED

Date 7/8/54

the manner and method used in completing said well, as required by V of Rule 112-A of the rules of the Commission.

2. That there is attached hereto as Exhibit "A" a plat showing the boundaries of the North Wilson Deep Unit Area and the location of the North Wilson Deep Unit No. 1 well and also the proposed limits of the Upper and Lower Bone Springs Pools as sought to be designated by a separate application filed with the Commission. There is also attached hereto and made a part hereof and for purposes of identification marked Exhibit "B", a schematic diagram of the proposed surface installation for the commingling of the production of oil from the Upper Bone Springs and the Lower Bone Springs Pools.

The gravity of the oil being produced from the Upper Bone Springs and the Lower Bone Springs Pools, respectively, and the anticipated monthly oil production therefrom, the values thereof, as well as the expected gravity of the commingled production are as follows:

	Upper Bone Springs	Lower Bone Springs
API Gravity	26	33
Anticipated Monthly Oil Production, Barrels	2600	1000
Weighted Average Gravity, Degrees API	28	

That the present crude price after trucking costs is $2.58 per barrel for the Upper Bone Springs oil and $2.72 for the Lower Bone Springs oil. It therefore appears that $2.62 per barrel will be received for the commingled production, which is the average should the oil be sold separately from the respective pools. On account of this situation applicant does not believe that the income from oil sales would be altered by commingling.

A request is being made to the Commissioner of Public Lands for approval of the commingling of production, as outlined above, and will be furnished to the Commission to be filed with this application.

Dated this 2nd day of July, 1964.

Respectfully submitted,

THE BRITISH-AMERICAN OIL PRODUCING COMPANY

By _____
Attorney

HINKLE, BONDURANT & CHRISTY
Attorneys for The British-American Oil Producing Company

Case 3091

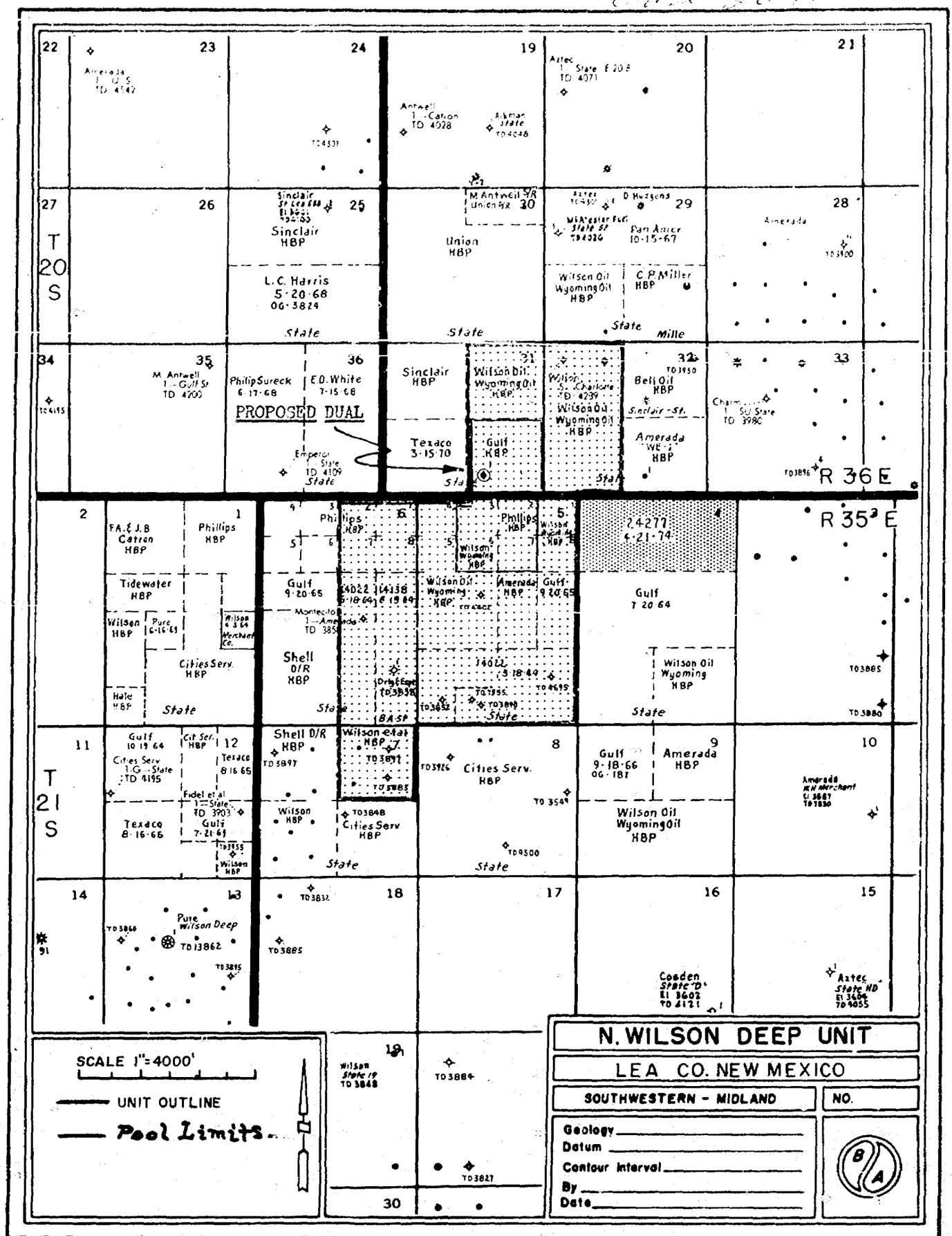
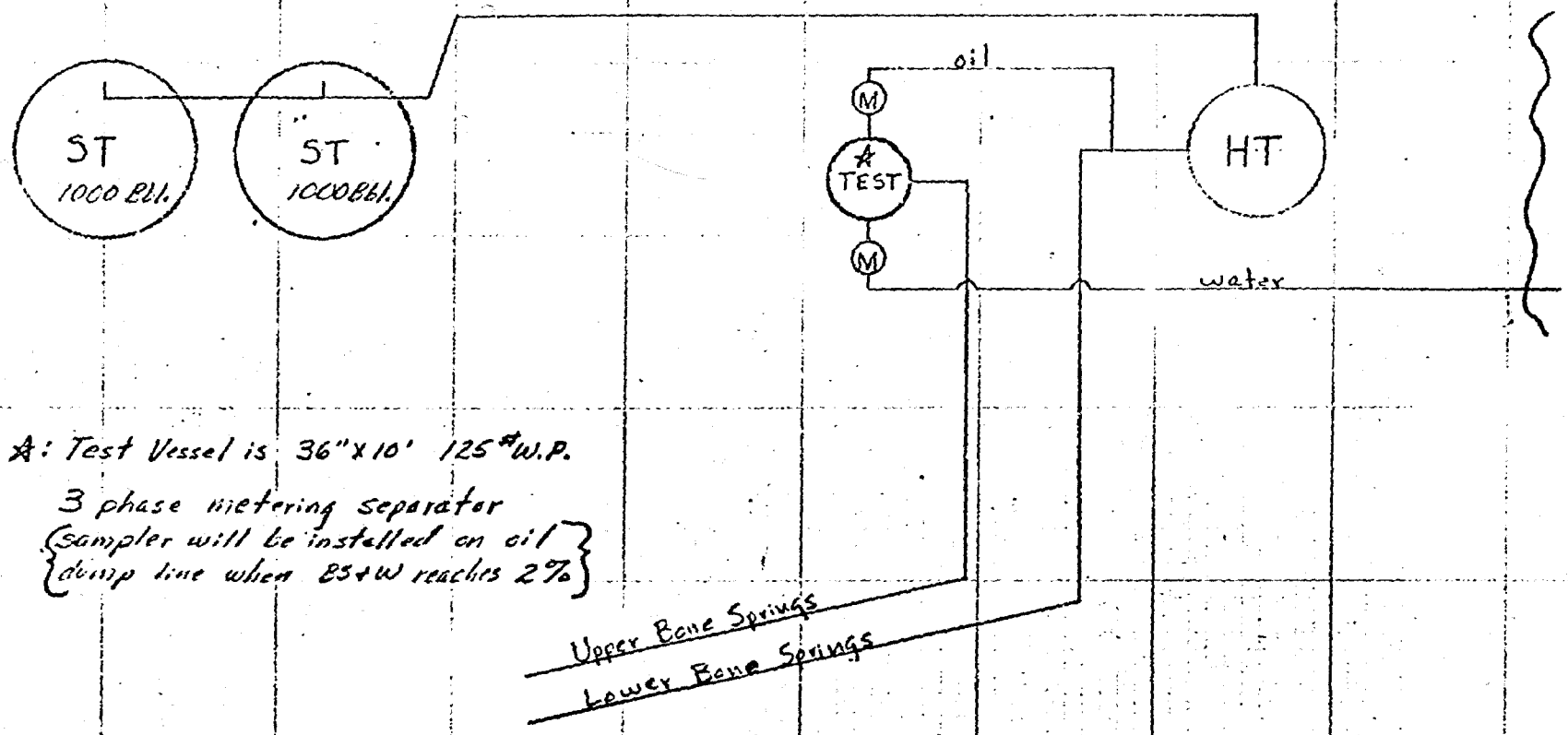


EXHIBIT "A"

EXHIBIT "B"

SCHEMATIC DIAGRAM
OF COMMINGLING FACILITIES
NORTH WILSON DEEP UNIT NO. 1



A: Test Vessel is 36"x10' 125# W.P.
3 phase metering separator
{sampler will be installed on oil dump line when BS+W reaches 2%}

Case 209

NEW MEXICO OIL CONSERVATION COMMISSION

SANTA FE, NEW MEXICO

7-3-58

APPLICATION FOR DUAL COMPLETION

Field Name	County	Date
Wilson - (Proposed)	Lea	6-29-1964

Operator	Lease	Well No.
The British-American Oil Producing Co.	North Wilson Deep Unit	1

Location of Well	Unit	Section	Township	Range
	O	31	20-S	36-E

1. Has the New Mexico Oil Conservation Commission heretofore authorized the dual completion of a well in these same pools or in the same zones within one mile of the subject well? YES ____ NO X

2. If answer is yes, identify one such instance: Order No. None ; Operator, Lease, and Well No.: ---

3. The following facts are submitted:	Upper Zone	Lower Zone
a. Name of reservoir	Upper Bone Springs	Lower Bone Springs
b. Top and Bottom of Pay Section (Perforations)	7888-7901	10,094 - 10,122
c. Type of production (Oil or Gas)	Oil	Oil
d. Method of Production (Flowing or Artificial Lift)	Beam Pumping Equipment	Beam Pumping Equipment

4. The following are attached. (Please mark YES or NO)

Yes a. Diagrammatic Sketch of the Dual Completion, showing all casing strings, including size and setting, top of cement, perforated intervals, tubing strings, including diameters and setting depth, location and type of packers and side door chokes, and such other information as may be pertinent.

Yes b. Plat showing the location of all wells on applicant's lease, all offset wells on offset leases, and the names and addresses of operators of all leases offsetting applicant's lease.

Yes c. Waivers consenting to such dual completion from each offset operator, or in lieu thereof, evidence that said offset operators have been furnished copies of the application.*

Yes d. Electrical log of the well or other acceptable log with tops and bottoms of producing zones and intervals of perforation indicated thereon. (If such log is not available at the time application is filed, it shall be submitted as provided by Rule 112-A.)

5. List all offset operators to the lease on which this well is located together with their correct mailing address.

Texaco, Inc., P. O. Box 728, Hobbs, New Mexico; P. O. Box 2248, Roswell, New Mexico.

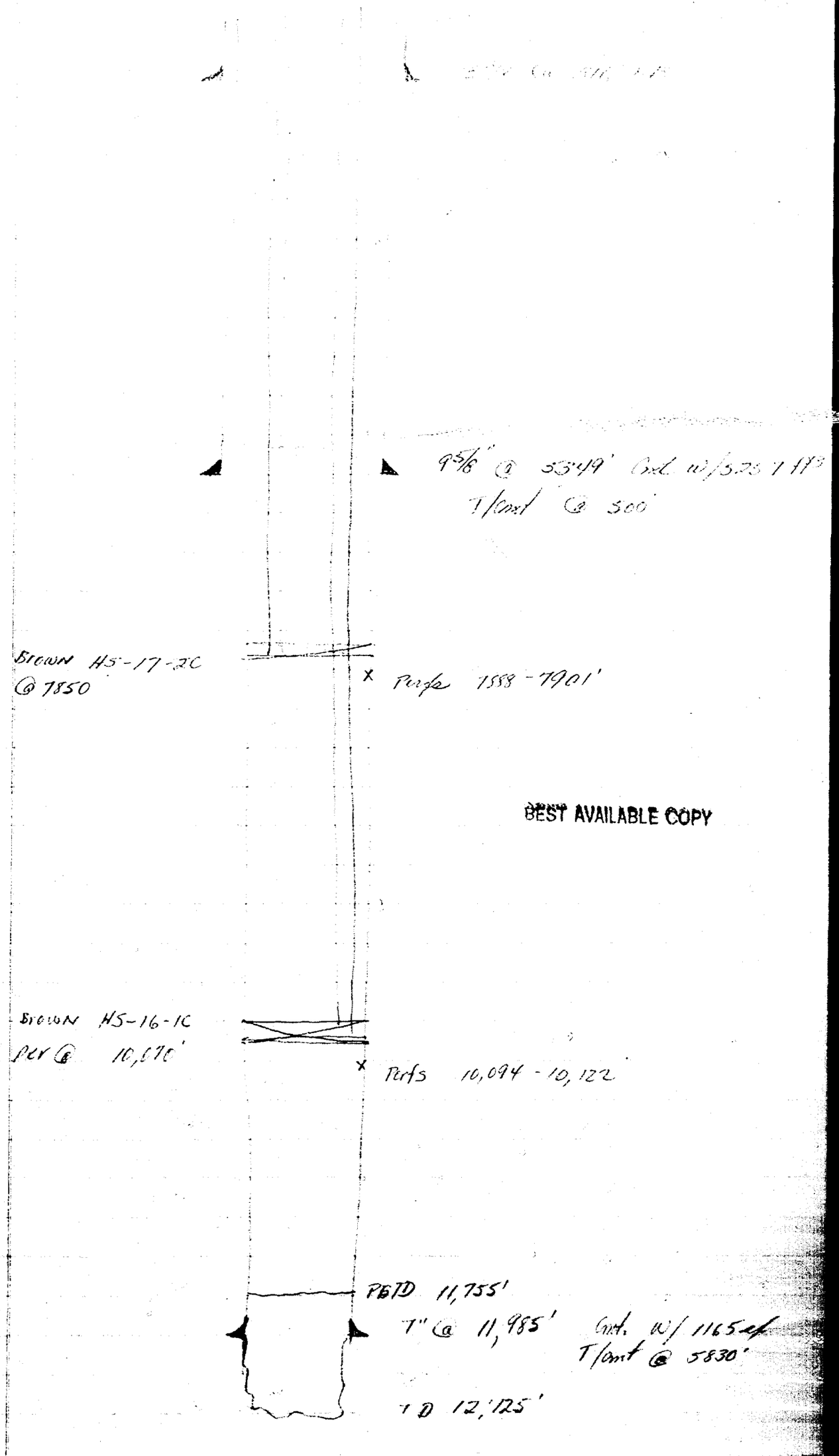
6. Were all operators listed in Item 5 above notified and furnished a copy of this application? YES X NO ____. If answer is yes, give date of such notification 6-29-64.

CERTIFICATE: I, the undersigned, state that I am the District Engineer of the The British-American Oil Producing Company (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

M. C. Steindorf, Jr. Signature

* Should waivers from all offset operators not accompany an application for administrative approval, the New Mexico Oil Conservation Commission will hold the application for a period of twenty (20) days from date of receipt by the Commission's Santa Fe office. If, after said twenty-day period, no protest nor request for hearing is received by the Santa Fe office, the application will then be processed.

NOTE: If the proposed dual completion will result in an unorthodox well location and/or a non-standard proration unit in either or both of the producing zones, then separate application for approval of the same should be filed simultaneously with this application.



GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

P. O. BOX 871
SANTA FE

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

August 3, 1964

Mr. Sim Christy
Hinkle, Bondurant & Christy
Attorneys at Law
Post Office Box 10
Roswell, New Mexico

Re: Case No. 3091 3092 3093
Order No. R-2755 R-2756 R-2757
Applicant: BRITISH-AMERICAN OIL PRODUCING CO.

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC
OTHER

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3091
Order No. R-2755

APPLICATION OF THE BRITISH-AMERICAN OIL PRODUCING COMPANY FOR A DUAL COMPLETION AND POOL COMMINGLING, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 22, 1964, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 3rd day of August, 1964, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, The British-American Oil Producing Company, seeks authority to complete its North Wilson Deep Unit Well No. 1, located in Unit O of Section 31, Township 20 South, Range 36 East, NMPM, Lea County, New Mexico, as a dual completion (conventional) to produce oil from the Upper Bone Spring formation and the Lower Bone Spring formation through parallel strings of 2 3/8-inch tubing, with separation of zones by a packer set at approximately 10,070 feet.

(3) That the mechanics of the proposed dual completion are feasible and in accord with good conservation practices.

(4) That approval of the proposed dual completion will prevent waste and protect correlative rights.

(5) That the applicant also seeks authority to commingle the Upper Bone Spring and the Lower Bone Spring production from its North Wilson Deep Unit Well No. 1 after separately metering the production from the Upper Bone Spring formation and determining the Lower Bone Spring production by means of the subtraction method.

(6) That approval of the proposed commingling installation will result in convenience and economy to the operator, will be in the interest of conservation, and will otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, The British-American Oil Producing Company, is hereby authorized to complete its North Wilson Deep Unit Well No. 1, located in Unit O of Section 31, Township 20 South, Range 36 East, NMPM, Lea County, New Mexico, as a dual completion (conventional) to produce oil from the Upper Bone Spring formation and the Lower Bone Spring formation through parallel strings of 2 3/8-inch tubing, with separation of zones by a packer set at approximately 10,070 feet;

PROVIDED HOWEVER, that the applicant shall complete, operate, and produce said well in accordance with the provisions of Rule 112-A of the Commission Rules and Regulations insofar as said rule is not inconsistent with this order;

PROVIDED FURTHER, that the applicant shall take packer-leakage tests upon completion and annually thereafter during the Gas-Oil Ratio Test Period for the Lower Bone Spring formation.

(2) That the applicant is hereby authorized to commingle the Upper Bone Spring and the Lower Bone Spring production from its North Wilson Deep Unit Well No. 1 after separately metering the production from the Upper Bone Spring formation and determining the Lower Bone Spring production by means of the subtraction method;

PROVIDED HOWEVER, that said installation shall be operated in accordance with the provisions of the Commission's "Manual for the Installation and Operation of Commingling Facilities."

(3) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jack M Campbell
JACK M. CAMPBELL, Chairman

E. S. Walker
E. S. WALKER, Member

A. L. Porter, Jr.
A. L. PORTER, Jr., Member & Secretary

esr/

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 22, 1964

EXAMINER HEARING

IN THE MATTER OF:

Application of the British-American Oil Producing Company for a dual completion and pool commingling, Lea County, New Mexico. Case No. 3091

Application of The British-American Oil Producing Company for the creation of a new oil pool and special pool rules, Lea County, New Mexico. Case No. 3092

Application of The British-American Oil Producing Company for the creation of a new oil pool and special pool rules, Lea County, New Mexico. Case No. 3093

BEFORE: DANIEL S. NUTTER, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: The hearing will come to order, please. Mr. Christy, I understand that you would like to consolidate all three of your cases.

MR. CHRISTY: That is correct. We would like to consolidate Cases 3091, 92, and 93. They are all germane to the subject, they apply to the same pools, the same well in the same unit area.

MR. NUTTER: We will call Case 3091.

MR. DURRETT: Application of the British-American Oil Producing Company for a dual completion and pool commingling, Lea County, New Mexico.

MR. NUTTER: Case 3092.

MR. DURRETT: Application of The British-American Oil Producing Company for the creation of a new oil pool and special pool rules, Lea County, New Mexico.

MR. NUTTER: Case 3093.

MR. DURRETT: Application of The British-American Oil Producing Company for the creation of a new oil pool and special pool rules, Lea County, New Mexico.

MR. NUTTER: Is there objection to the consolidation of these three cases for testimony purposes? The cases will be consolidated.

MR. CHRISTY: Sim Christy of Hinkle, Bondurant and

Christy, Roswell, New Mexico, attorneys for the Applicant, British-American Producing Company. We have one witness.

(Witness sworn.)

JERRY BENTON

called as a witness, having been first duly sworn on oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CHRISTY:

Q Would you please state your name, address, occupation and by whom you are employed and in what capacity?

A My name is Jerry Benton. I live in Midland, Texas and I'm employed by The British-American Oil Producing Company as District Staff Engineer.

Q Mr. Benton, would you please briefly tell us a little history on your education, any degrees you seek and where in petroleum engineering and your experience, if any, in the petroleum engineering field?

A I graduated from the University of Oklahoma in 1956 with a Bachelor of Science Degree in petroleum engineering. I worked for Plymouth Oil Company for six years as a field and a reservoir engineer. I worked for Marathon Oil Company about fourteen months as a field engineer, and I have worked for British-American approximately one year as a staff engineer.

Q Are you familiar with the area involved in Cases 3091, 3092 and 3093 as well as the well in question and the general area petroleum engineering-wise involved in these applications?

A I am.

Q And you are familiar with what is sought by the applications?

A I am.

MR. CHRISTY: Does the Examiner have any question concerning his qualifications?

MR. NUTTER: No, sir. Go ahead.

Q Would you briefly tell the Examiner what is sought by these applications?

A We seek permission to dually complete the North Wilson Deep Unit No. 1 in the Upper and Lower Bone Springs zones. We seek permission to commingle this production, and we also seek temporary 80-acre spacing for both zones and pool rules for both zones.

Q Special pool rules?

A Special pool rules, that is correct.

Q I believe British-American is the unit operator of the North Wilson Deep Unit in which this well is located?

A That is true.

(Whereupon, Applicant's Exhibit No. 1 was marked for identification.)

Q I refer you to Exhibit 1 and ask you if the hashed marks depicted there are the unit boundaries, is that correct?

A That's correct.

Q Now, the well in question, the North Wilson Well No. 1 is located in the Southwest, Southeast of 31 in 20 South, 36 East?

A That's right.

Q And spotted in red on the map, Exhibit 1?

A That's right.

Q When was that well completed?

A The upper zone was completed June 4th, 1964.

Q The lower zone?

A It was potentialed on May the 29th.

Q You are still testing on that zone?

A That's right.

(Whereupon, Applicant's Exhibit No. 2 was marked for identification.)

Q With respect to the dual completion, I'll ask you first if you'll refer to Exhibit 2, that is your mechanic's proposed dualing, is it not?

A That is correct.

Q Would you briefly tell the Examiner how you propose to dually complete and produce from the two zones in question, referring to that Exhibit 2?

A This well was drilled to a total depth of 12,725 feet, 7-inch casing was set at 11,955 feet, and the well was plugged back to 11,755 feet. The Upper Bone Springs was perforated from 7888 to 7901, and the Lower Bone Springs was perforated from 10,094 to 10,122 feet.

A Brown HS 16 one-seat packer was set above the lower zone perforations and a string of 2-3/8ths-inch tubing was run to that packer. A Brown HS 17 two-seat dual packer was set above the Upper Bone Springs and the short string of 2-3/8ths-inch tubing was set in this packer. The well will be produced through these two separate strings of tubing.

Q We'll come into it a little more later. Is this sweet or sour crude?

A It's sweet crude.

Q These are retrievable-type packers?

A That's correct.

Q I notice your total depth is 12,175 feet. Have you set cement from the T.D. back up through to the casing point?

A That's right, we plugged back to 11,755 feet in the 7-inch.

MR. NUTTER: With cement?

A Yes, sir. There's also a bridge plug on top of this cement.

Q (By Mr. Christy) That bridge plug is depicted on Exhibit 2, is it not, at 11,755?

A That's right.

Q Is that a rather orthodox method of dual completing, Mr. Benton?

A It is.

Q And you will not be producing anything through the casing?

A No, sir.

(Whereupon, Applicant's Exhibit No. 3 was marked for identification.)

Q With respect to commingling of the fluids as they reach the surface and referring to Exhibit 3, will you please explain to the Examiner your proposed method of commingling the two zones?

A We propose to run separate flow lines from the well to the tank battery with the Lower Bone Springs being run through the heater treater and water from this zone dumped to the pit and oil going to the stock tanks. The Upper Bone Springs will come from the well through a three-phase metering separator. It will meter oil, water and gas, and the water being dumped to the pit from this test separator and the oil going through the heater treater then to the stock tanks.

Q I notice a little notation down in the bottom of Exhibit

3, something when your BS and W reaches two percent you propose additional installation. What is that?

A We propose to install a sampler on the oil metering side of the test separator from this sample to more accurately determine oil production from the Upper Bone Springs.

Q I see on Exhibit 3 how you can separately test the upper zone, how can you separately test the lower zone?

A We can do that one of two ways. We can close the water dump on the heater treater and produce all fluid from the Lower Bone Springs and the oil from the Upper Bone Springs to the stock tanks and then gauge and bleed off our water and subtract production from the Upper Bone Springs.

Q That's one method, what's the other one?

A We can shut-in in the Upper Bone Springs and test the Lower Bone Springs into the tank.

Q Shut off your Upper Bone Springs, close your heater treater and run it to the tanks. You don't need to close off your heater treater?

A We go through the heater treater to stock tanks.

Q Do you propose to separately meter these two zones at periodic intervals?

A The Upper Bone Springs will be tested every day. We will test the Lower Bone Springs at least once every month.

Q In the manner in which you just mentioned?

A Yes, sir.

Q Is that a rather orthodox method of commingling?

A Yes, it is. It is commonly used.

Q I believe Rule 303 of the Commission Rules provides for the approval of the Commissioner of Public Lands when state lands are involved. I call your attention to the fact that state lands are involved. Has this matter been discussed with the Commissioner's Office?

A Yes, this morning.

MR. CHRISTY: For the record, we wrote the Unit Division of the Commissioner's Office on July 2nd. Unfortunately the letter was almost lost, it was found this morning and Mrs. Rhea, who is in charge of the Unit Department, said they had no objection to the proposed commingling of the fluids on the state properties.

(Whereupon, Applicant's Exhibit No. 4 was marked for identification.)

Q Your application further seeks temporary 80-acre spacing for both the upper and lower zone involved in this, and I refer you now to Exhibit 4 and ask you what that is. Identify it and explain it to the Examiner.

A Exhibit 4 shows some Bone Springs field in the immediate area of the North Wilson Deep Unit No. 1. Since we had no

previous information, or have no previous information on the characteristics of the Bone Springs, we investigated these fields, particularly the Lea and the Scarb fields, to obtain a comparison as to what we might expect.

Q I believe this exhibit reflects that the Lea Unit, which is producing from two, both the Upper and Lower Bone Springs, is approximately 8.5 miles to the west, northwest, and the Scarb field producing from the Lower Bone Springs is approximately twelve miles to the northwest?

A That is correct.

Q Those are your points for comparison because there's only one well in this unit at this time?

A That's right.

(Whereupon, Applicant's Exhibit No. 5 was marked for identification.)

Q Referring to Exhibit 5, would you please tell the Examiner what this is and what relation it has to the proposed 80-acre spacing?

A This is merely electric logs from the Scarb field and the Lea field and the North Wilson Deep Unit. It shows the zones completed in each of these fields and the Bone Springs section formation. It shows that the Bone Springs section is similar in all three fields.

Q These are taken from the logs on the wells as indicated. I notice the Scarb field is simply producing from what you denominated as the lower zone.

A Lower zone or Bone Springs.

Q Did it encounter the upper zone at all?

A There was no commercial production in the upper zone.

Q Formation was there but no commercial production?

A That's right.

Q In the Lea field they encountered both the upper and the lower zones but the upper zone is producing from considerably lower than your proposed upper zone, is that correct?

A That's correct.

Q Then your North Wilson Deep log is here on the extreme right of Exhibit 5?

A There's approximately 2200 feet between the two zones.

Q How much distance between your proposed upper and lower zone?

A 2200 feet.

Q And they are both Bone Springs?

A Yes.

Q Do you have a log on the No. 1 well here involved?

A Yes.

(Whereupon, Applicant's Exhibit No. 6 was marked for identification.)

Q That has been marked as Exhibit 6?

A Yes, sir.

Q Do you feel that the characteristics of the Scarb, Lea and North Wilson fields are similar so that comparison may reasonably be drawn from what has occurred in the Lea and Scarb Units as to what you may expect will occur in this well in the area?

A Certain characteristics, yes. In particular the lower zone in each of these fields has approximately the same bottom hole pressure and the same porosity.

Q Could we skip over to Exhibit 8 and carry that on a little further and explain what Exhibit 8 reflects with respect to the similarity of characteristics that you just spoke of?

(Whereupon, Applicant's Exhibit No. 8 was marked for identification.)

A Exhibit 8 shows some average characteristics of the Upper Bone Springs zone in the North Wilson Deep Unit No. 1 and the Lea Bone Springs. As you can see, the only comparison there is some porosity with the bottom hole pressure and the oil gravity being considerably different. In the Lower Bone Springs all three fields produce from this zone and the bottom hole pressure and the porosity in this lower zone compares very favorably, or is a good comparison. The oil gravity is again different in the North

Wilson Deep Unit No. 1.

Q From what we know of the Lea Unit and from the Scarb Unit and from what we may anticipate therefrom from this unit area, do you feel that one well will effectively and efficiently drain 80 acres in the areas involved in these applications?

A We made our investigations of the Lea Unit since it's the only Bone Springs that has produced long enough to set a decline. It appears from the reserves we calculated there that they are draining 80 acres or more from those wells.

Q You, therefore, anticipate this area will do the same thing?

A Yes, sir.

Q You simply at this time seek temporary 80-acre spacing in order to have it to prove up the point?

A That is correct.

Q How long do you feel that this temporary order should be in force?

A We would like approximately one year.

Q About one year to develop the area and have a little more information to present to the Commission?

A Yes, sir.

(Whereupon, Applicant's Exhibit No. 7 was marked for identification.)

Q The matter of economics always raises its head in 80-acre spacing. I will ask you to refer to Exhibit 7 and tell us a little about the economics as to whether this should be developed on 40 or 80-acre patterns.

A Exhibit 7 is based on data that we obtained from the Lea Unit. We estimated for a dual Upper and Lower Bone Springs completion on 80-acre basis, that ultimate primary recovery would be 330,000 barrels. After net profit, before Federal Income Taxes, would be $406,000 as shown on this exhibit. Profit to investment ratio would be 1.60, which is above what our company has set forth as a minimum. We use a minimum of 1.5 from experience.

Q In other words, you found from experience that a profit ratio of less than 1.5 is an uneconomical venture?

A That's right.

Q Go ahead.

A On 40 acres drainage, using one-half of the reserves assigned to 80-acre drainage, the profit to investment ratio is twenty cents on the dollar. Condition 2 shown on Exhibit 7 is a single Upper Bone Springs completion, which in neither case would fit British-American's minimum profitability requirement. On 80-acre spacing the Upper Bone Springs would return 94 cents on a dollar.

Q I notice that your Exhibit 7 does not show the third

possible condition, that is a single completion in the lower zone. Is there a reason for that?

A Yes, sir. The lower zone has even less reserves than the upper zone.

Q It's so uneconomical it's no use putting on the exhibit?

A Yes, sir.

Q You propose special pool rules for what you've denominated as the upper and lower zone of the Bone Springs, in your opinion are these separate reservoirs?

A Yes, sir.

Q Separate pools?

A Yes.

Q And they're separated by some 2200 feet of interval?

A Yes.

Q What area do you feel is reasonably proved as productive from the upper zone by virtue of the North Wilson Deep No. 1 well?

A We feel that the Southeast Quarter of Section 31, Township 20 South, Range 36 East and Lots 2, 3, 6 and 7 in Section 5, Township 21 South, Range 35 East have been reasonably proved productive by this well.

Q I assume, then, that that would be your proposed pool area that you would propose to the Commission for the upper zone?

A That's right.

MR. NUTTER: What was the area in Section 31 again?

MR. CHRISTY: Southeast.

A Southeast Quarter.

MR. NUTTER: Southeast Quarter?

MR. CHRISTY: Yes.

Q (By Mr. Christy) Now for the lower zone.

A The same.

Q The same?

A Yes.

MR. CHRISTY: As to features of the special pool rules, Mr. Examiner, the Applicant has suggested that each well that is completed or recompleted in the respective pools be located on a standard unit comprising 80 acres consisting of either the North Half, the South Half, the East Half or the West Half for flexibility of a single governmental quarter section, provided, however, that the first well drilled on any quarter section shall be located in either the northeast or southwest of the governmental quarter section. This will permit flexibility for topographical and other reasons. It will hold the spacing pattern in some type of uniformity.

They propose further that all wells be located within 200 feet from the center of the quarter, quarter section where the well is drilled and that each standard proration unit be assigned

an 80-acre allowable with a proportionate factor, and in the event that more than one well is drilled on an 80-acre proration unit, the allowable for the unit may be produced from either or both of the wells in any proportions, is that correct, on British-American proposals?

A That is correct.

Q For the pool rules. Those rules, now, they are similar if not identical to the Lea Unit rules?

A That is correct.

Q Is there anything on these exhibits that I have overlooked that should be brought to the attention of the Examiner?

A It's on the exhibits, but I don't remember whether it was brought out or not, but to further substantiate separate reservoirs on drill stem test the pressure of the upper zone was approximately 3600 pounds and that of the lower zone was approximately 4200 pounds.

Q That's shown on Exhibit 8?

A Yes, sir.

Q Were these exhibits prepared by you or under your direct supervision except for Exhibits 5 and 6 consisting of logs?

A That's right.

Q In your opinion would the 80-acre proration units established under your application, would that prevent the drilling of

unnecessary wells?

A Yes, sir.

Q And that, of course, would avoid the augmentation of risk, would it not?

A Yes, sir.

Q And would prevent waste, including economic waste?

A Yes.

Q Do you see how any of the correlative rights of any of the parties will be violated by 80-acre spacing?

A No.

Q This is a fully participating unit, unitwise, and the area comprised here is under one state lease, covers this 80 acres proposed?

A Right.

MR. CHRISTY: I might add to the Examiner that Mrs. Rhea of the Unit Division of the Commissioner's Office advised me that the state had no objection to the 80-acre spacing. We offer in evidence Exhibits 1 through 8 inclusive.

MR. NUTTER: Applicant's Exhibits 1 through 8 will be admitted in evidence.

(Whereupon, Applicant's Exhibits 1 through 8 were offered and admitted in evidence.)

MR. CHRISTY: We have no further questions of this

witness.

MR. NUTTER: Any questions of the witness?

MR. DURRETT: I have a question, please.

CROSS EXAMINATION

BY MR. DURRETT:

Q Mr. Benton, upon what do you base your conclusion that one well will efficiently and economically drain 80 acres? Is that based upon the --

A I don't know whether it's a pool or a unit, I assume it is possibly both. Is that a Lea pool or is that a unit?

MR. NUTTER: There's a Lea pool and a Lea unit.

A It's called the Lea field and also the Lea unit.

Q Well, a study of the data from that pool, is that what you base your conclusion on concerning drainage in your proposed pool?

A Yes, sir. Using logs from the Lea Unit and cumulative recoveries to date, I worked backwards to establish a recovery factor, assuming all this oil was coming from 80 acres, and with the pressure depletion type reservoir this recovery would be on the order of 33 percent, which is extremely high and, therefore, appeared to me to be draining more than 80 acres for that reason.

Q That's on the Lea area?

A Yes, sir.

Q How many wells do you have in your pool, just one?

A Just one well.

Q Are you proposing, or can you state now whether or not your company proposes to drill additional wells in the near future, or how near in the future?

A Presently we anticipate drilling well to the south this fall starting sometime in October.

Q Some place in Section 5?

A Yes, sir. In the center of Lot 5, Section 5. It's the center of Lot 6.

Q Lot 6?

A Yes, sir.

MR. NUTTER: That wouldn't conform with your proposed locations?

A You are right, it's Lot 5, my error.

Q (By Mr. Durrett) Could we safely say Lot 5 or Lot 6, according to the one which conforms to the rules?

A Yes.

MR. CHRISTY: According to the rules it would be Lot 5.

MR. NUTTER: You definitely want the proposed rules to provide for locations in the Northeast Quarter or the Southwest Quarter, don't you?

MR. CHRISTY: That's right.

A Yes.

MR. CHRISTY: As to the first well drilled in any quarter section?

MR. NUTTER: Yes.

MR. CHRISTY: That is correct.

MR. LAMB: I am with Wilson Oil Company and my memory on this proposal, of course, I don't want to interfere with British-American's testimony, but there is a Morrow gas zone that I believe their ultimate aim on the second well will be aimed to the Morrow gas and will be in Lot 6. There's Morrow gas in this well, but it was elected not to complete and that the next well the aim of it will be for the Morrow gas and will be in Lot 6. This is my understanding of our plans.

MR. NUTTER: According to your revised Rule 104 for Pennsylvanian or deeper gas wells, the well, the gas well would have to be in Lots 2, 3, 6 or 7 or be an exception to the rules. I suggest since this little apparent discrepancy has come up that this thing be checked out definitely and that we be advised. There's no sense writing the pool rules restricting the locations to an area that's going to be out of face with the next well.

MR. CHRISTY: Not at all.

A That's certainly true, you are right.

MR. LAMB: The next well, the objective of the next well is primarily for Penn gas.

MR. NUTTER: And you know the Rule 104 for Pennsylvanian or deeper gas wells, the new revised eliminates the two end 40's of each half section for the location. So the center four 40's would be in compliance with that rule for deeper gas wells.

MR. LAMB: You look at the Bone Springs in it, but as I understood, the next well would be in Lot 6 and the main objective would be the Morrow gas data obtained from it could be used for the Bone Springs.

MR. NUTTER: In which case the existing well is an exception to the pattern for the next well.

MR. CHRISTY: I'll check that out, Mr. Examiner, and advise you within one week the problem on this Southwest, Northeast. However, I believe if the Morrow gas well drilled in Lot 6 is completed in the Morrow it wouldn't have anything to do with this.

MR. NUTTER: Or if it was a dual completion in the Bone Springs or possibly a triple completion.

MR. CHRISTY: You would be right back. I will check it and advise the Commission in one week. I wasn't aware of this.

Q (By Mr. Durrett) When was your Well No. 1 completed, Mr. Benton?

A June the 4th.

Q Of recent completion?

A Yes.

Q Once again now, what is your proposed horizontal limits for both pools?

A The Southeast Quarter of Section 31, Township 20 South, Range 36 East and Lots 2, 3, 6 and 7, Township 21 South, Section 5, Township 21 South, Range 35 East.

Q Lots 2, 6 and 7?

A 2, 3, 6 and 7.

MR. CHRISTY: It is in effect a long 320. That well must be in Lot 6 then.

MR. DURRETT: I think that's all I have.

BY MR. NUTTER:

Q Mr. Benton, in arriving at your reserves of 189,000 for the upper and 114,000 for the lower, are these volumetric calculations?

A No, sir, they're calculations from the decline curves.

Q Decline curves in the Lea Bone Springs?

A In the Lea Bone Springs.

Q So you haven't actually considered the calculated porosity or any connate water or formation volume factor or recovery factors in anything in arriving at a reserve for this pool itself?

A We did do that, and using an average recovery factor of 12 percent for solution gas reservoir we came up with approximately 120,000 barrels reserves for both zones.

Q 120,000 barrels at 12 percent recovery?

A Yes, that's using volumetrics.

Q Do you recall what connate water you used in making that?

A We used 15 percent, which may be low.

Q Do you remember what your volume factor was?

A I believe I used the 1.3 since this is gravity crude. Gravity was so low.

Q And you had your 7.4 percent porosity?

A Yes.

Q And 5.4 percent porosity for the two zones. In our notice for this first case here I believe we stated that the commingling would occur after separately metering the Lower Bone Springs production. However, you are actually proposing to meter the Upper Bone Springs continuously?

A Yes.

Q And determine the lower by means of the subtraction method?

A Yes.

Q That's no serious discrepancy there from the notice. It

doesn't really make much difference. On your dual completion, Mr. Benton, what's the GOR of your upper zone?

A 318.

Q And what's the GOR on your lower?

A 256.

Q And I think we can get the gravities of the two, being 26 and 33 from Exhibit 8?

A Yes, sir.

Q And the bottom hole pressures, please?

A The upper zone is 3600, the lower zone 4200.

Q The top of the cement on the 7-inch pipe is well above the Upper Bone Spring perforation, is it not?

A 5830.

Q Could you describe the mechanism of the Brown HS16 1-seat packer which separates the two zones?

A It is similar to a permanent type packer in this respect, that it has slips looking both up and down.

Q What is it set by, weight or rotation or what?

A Rotation. It is also released by rotation.

Q As to vertical limits of these pools, what do you propose that the vertical limits of the two pools be?

A That would be approximately 7850 to 7950 for the upper zone and 10,050 to 10,150 for the lower zone.

Q Are there any little stringers or possible pays other than the two perforated intervals that were apparent on the logs?

A Yes, sir. There was an interval just above this, what we call the lower zone. It was from 10,040 to 10,060. We perforated that zone and swabbed salt water. On a drill stem test of the zone we recovered oil and water, but we never obtained any oil on swab test.

Q Mr. Benton, I wonder if in the event in drilling other wells that you'd find little other stringers that you might want to include in the vertical limits here that we might not make the vertical limits and get broader. What would be the actual top of the Bone Spring limestone on this well?

A It's 7750. The character of this Bone Springs, so I'm told, is that you can find porosity and pay any place in it. It will disappear from one well to the next. Setting up vertical field limits is pretty much of a guess any way you go.

Q What's this stuff down here at approximately 8800?

A It looks like that gets awfully dense and tight in there.

Q I'm just looking at the little cross section down there at 8800 where it Mae Wests in.

A Oh, yes. That was a shaley sand, I believe, that's correct. We drill stem tested that and recovered nothing.

Q That was a shaley sand in there?

A Yes.

Q We can make these vertical limits as you've suggested there just a hundred feet.

MR. CHRISTY: In line with the suggestion of the Examiner, we amend that on the upper zone to start at the top.

Q To start at the top of the Bone Springs and go wherever you want to down in there?

A Why don't we go to 8,000 feet.

Q Down to 8,000?

A Yes, sir.

Q So it would be from the top of the Bone Springs at 7750 to 8,000?

A Yes, sir.

Q For the upper?

A And the lower on this log I would say from 10,000 feet to 10,200.

Q Ten to ten two?

A Yes.

MR. NUTTER: Are there any other questions of Mr. Benton? He may be excused.

(Witness excused.)

MR. CHRISTY: That's all for the Applicant.

MR. NUTTER: Do you have anything further, Mr. Christy?

MR. CHRISTY: No, sir.

MR. NUTTER: Does anyone have anything they wish to offer in Cases 3091, 3092 and 3093?

MR. SNYDER: I have a statement. A. E. Snyder, Amerada Petroleum Corporation. Amerada has a small interest in this unit and although we don't have a great deal of information on it at this time we would like to go on record as supporting the temporary 80-acre spacing application of British-American.

MR. NUTTER: Thank you, Mr. Snyder. Does anyone else have anything? We'll take the cases under advisement and the hearing is adjourned.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 3rd day of August, 1964.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3091-3092-3093 heard by me on July 22, 1964.

....., Examiner
New Mexico Oil Conservation Commission

CASE 3091: Application of THE BRITISH-AMER. OIL PROD. CO. for a dual compl. & pool commingling.